

Taxonomic Notes on *Ophiopogon* of South Asia X

Noriyuki TANAKA

Department of Education, School of Liberal Arts, Teikyo University,
Ôtsuka 359, Hachioji, Tokyo, 192–0395 JAPAN

(Received on April 4, 2000)

Ophiopogon confertifolius N. Tanaka is described as new from the Malay Peninsula, Thailand. This species resembles *O. fooningensis* F.T.Wang & L.K.Dai from Yunnan (China), but differs from it in the number of leaves, the relative length of bracts to flowers, and the colour of flowers. A new variety, *O. platyphyllus* Merr. & Chun var. *hayatae* N.Tanaka, is described from northern Vietnam. This variety differs from var. *platyphyllus* chiefly by the pedicels articulate in the upper part. No confirmatory evidence has been obtained for the spontaneous occurrence of *O. japonicus* (Thunb.) Ker Gawl. in southern Asia (excluding China). A key to the 17 species of this genus hitherto recognized in this series of research is provided. (Continued from J. Jpn. Bot. 75: 360–367, 2000)

Key words: Key to species, new taxa, *Ophiopogon confertifolius*, *Ophiopogon japonicus*, *Ophiopogon platyphyllus* var. *hayatae*

(19) A new species from the Malay Peninsula of Thailand

Ophiopogon confertifolius N.Tanaka, sp. nov. [Figs. 1–3]

Haec species *Ophiopogoni fooningensi* F.T.Wang & L.K.Dai affinis, a quo foliis pluribus (ca. 35–70), bracteis floribus aequilongis vel longioribus, et floribus albis differt. Etiam *O. caulescenti* (Blume) Backer et *O. pierrei* L.Rodr. similis, sed a priore filamentis liberatis et ovario apice plano, a posteriore ovario apice plano diversus.

TYPE: Thailand. Malay Peninsula. Nakhon Si Thammarat, Khao Luang area, near Khiri Wong village, ca. 500–600 m, May 16, 1968, fls white, bracts purple, C.F.van Beusekom and C. Phengkhilai 787 (holotype, L; isotypes, K, P).

Glabrous perennial herb. Stem more than 11.5 cm long, emitting ligneous prop roots to 3.7 mm in diameter. Leaves many (ca. 35–

70), fasciculate on apical part of stem, linear, acute at apex, tapering to base which is sheathing with scarious alae, serrulate on margins, 7–11-veined, midvein prominently elevated beneath, especially in lower part, to ca. 58 cm long, to 1 cm wide. Scape rather strongly declinate in lower part, complanate, to ca. 24 cm long. Inflorescence racemose, 5.5 cm long. Bracts ovate to lanceolate, acuminate or aristate, scarious at margin, entire or almost entire, to 12 mm long, usually as long as or exceeding flowers. Pedicels (including basal stalky part of perianth) jointed above middle, to 4.5 mm long (true pedicels to 3 mm long) at flowering; at fruiting they jointed around middle, to 7.5 mm long (true pedicels to 4 mm long). Flowers 1–2 (rarely 3) at each bracteal axil. Floral buds ovoid. Perianth lobes 6, ovate-lanceolate or ovate-oblong, obtuse at apex, 6–7.5 mm long, 2.7–3.5 mm wide, 1-veined, white. Stamens 6,

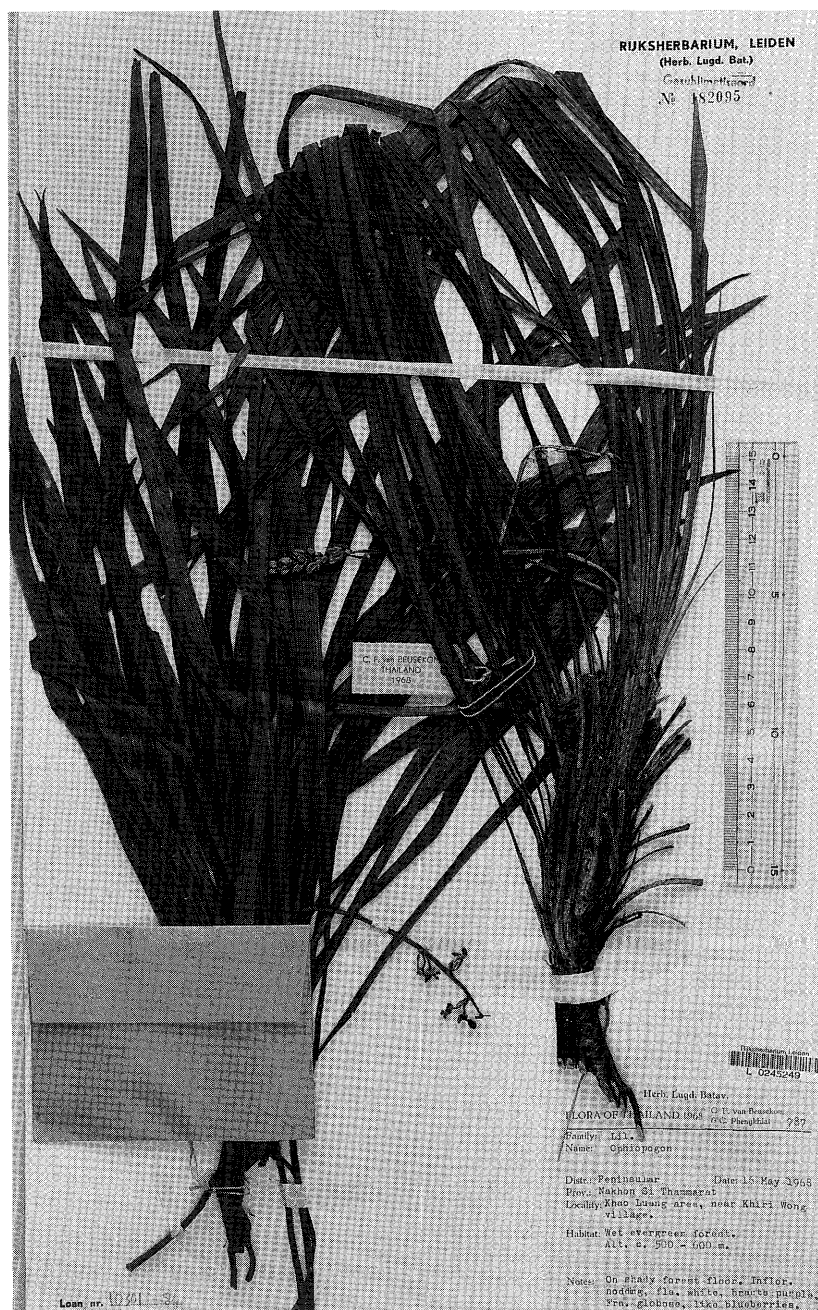


Fig. 1. Holotype of *Ophiopogon confertifolius* (Thailand, Khao Luang area, C. F. van Beusekom and C. Phengklai 787, L).

free. Anthers narrowly lanceolate, cordate at base, introrse, 3.8–4 mm long. Filaments broadened toward base, ca. 0.5 mm long.

Pistil 1. Style subulate, 6.3 mm long, minutely 3-toothed at apex. Ovary inferior, rather flat at apex. Seeds coated with

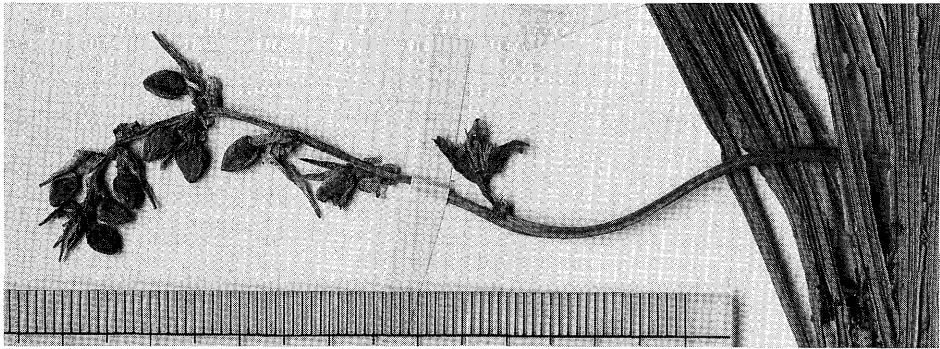


Fig. 2. Inflorescence of *Ophiopogon confertifolius* (Thailand, Pangnga, R. Geesink and T. Santisuk 5152, paratype, L).

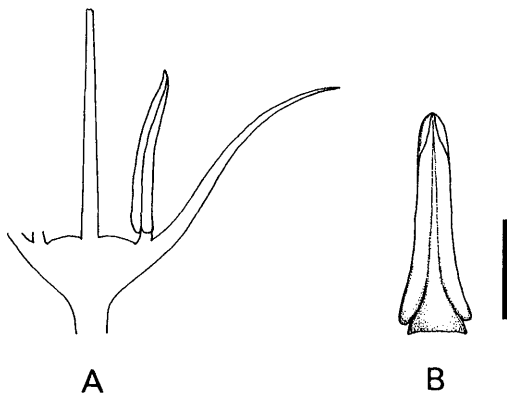


Fig. 3. *Ophiopogon confertifolius*. A. Diagram of flower (side view). B. Abaxial side of stamen (C. F. van Beusekom and C. Phengkhlai 787, L). Scale bar for B = 2 mm.

sarcotesta, globose.

Distribution: S Thailand (Malay Peninsula).

Ophiopogon confertifolius (Figs. 1–3) resembles *O. fooningensis* F.T.Wang & L.K.Dai (Dai and Chen 1978) described from southeastern Yunnan (China). The two species share an elongate stem putting forth several woody prop roots, relatively narrow leaves, short pedicels articulate above the middle, an ovary which is rather flat at the top (Fig. 3A for *O. confertifolius*), and free

stamens (Fig. 3B for *O. confertifolius*). In *O. fooningensis*, however, the leaves are fewer (ca.15–35 on each plant) and appear to be slightly firmer in texture, the bracts are shorter than the flowers except those in the lower part, and the flowers are light purple (Wang 89114, KUN, PE). In addition, the localities of the two species are geographically fairly apart.

This new species also resembles *Ophiopogon caulescens* (Blume) Backer (cf. Tanaka 2000a, 2000e) and *O. pierrei* L.Rodr. (cf. Tanaka 2000a), both natives of southeast Asia, but differs from the former by the free filaments and the ovary which is relatively flat at the top (Fig. 3A), and from the latter also by the flat-topped ovary.

Other specimens examined:

Thailand. Malay Peninsula. Pangnga, Khao pawta luang keow, ca.800–1000 m, May 2, 1973, scape and flowers entirely white, bracts purplish at base, R. Geesink and T. Santisuk 5152 (paratype, C, L).

Ophiopogon fooningensis: China. Yunnan. Fooning, Lung-mai (Long-may), 1000 m, flowers light purple, May 3, 1940, fl., C.W.Wang 89114 (holotype, PE; isotype, KUN).

(20) A new variety of *Ophiopogon platyphyllus* from northern Vietnam

Ophiopogon platyphyllus Merr. & Chun in J. Bot. Inst. Col. Agr. Sun Yatsen Univ. 2: 211, pl.38 (1935); N.Tanaka in J. Jpn. Bot.

75: 133 (2000).

var. **hayatae** N.Tanaka, var. nov.

[Figs. 4–6]

O. hayatae T.Koyama in sched. (TI),

'hayatai'.

A typo pedicellis superne articulatis differt. Foliis angustis (usque ad ca. 32 cm longis, 0.7 cm latis) et floribus relative

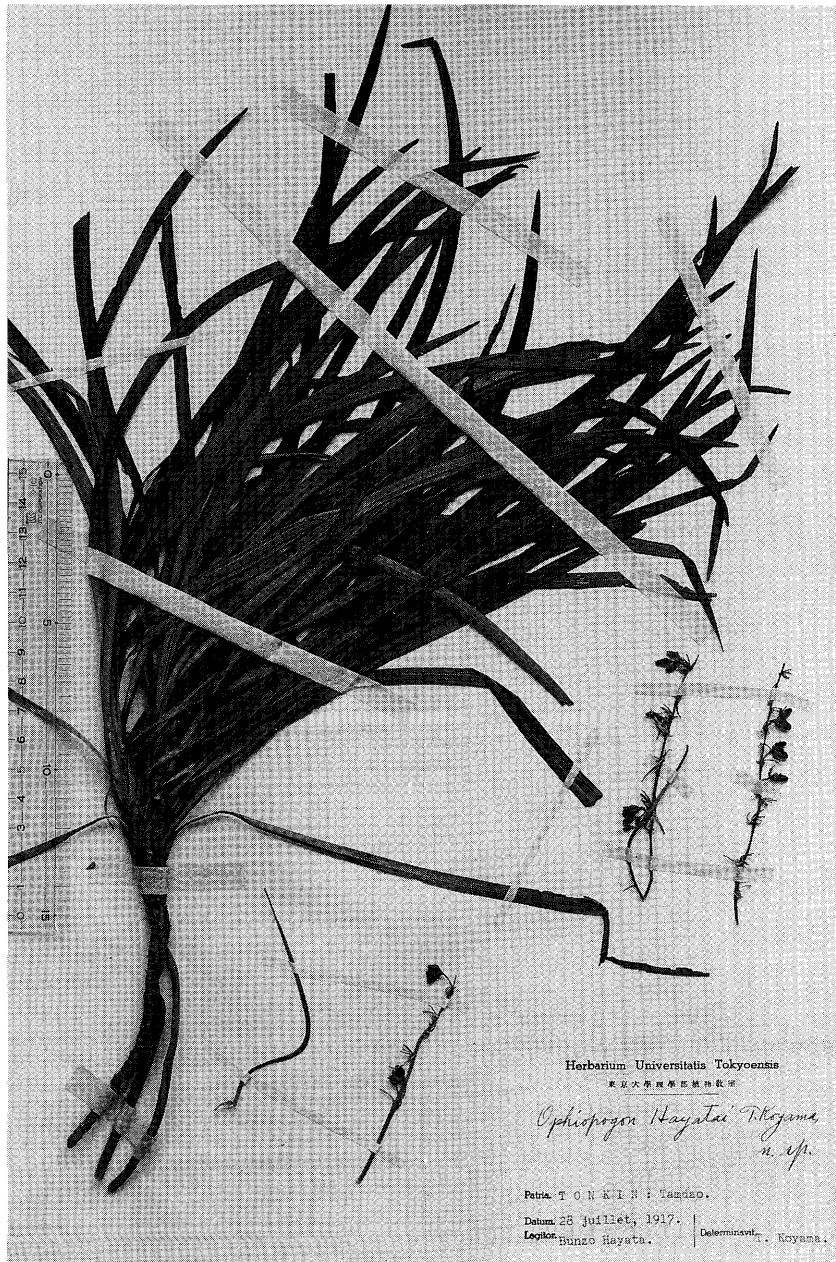


Fig. 4. Holotype of *Ophiopogon platyphyllus* var. *hayatae* (northern Vietnam, B. Hayata s.n., TI).

parvis (lobi perianthii 4.2–5 mm longi; antherae 2.8–3.2 mm longae) notabilis.

TYPE: Vietnam. Tonkin, Tamdao, Juillet 28, 1917, fl.–fr., B.Hayata s.n. (holotype and isotype, TI).

Stem to ca. 12 cm long, to 5 mm in diameter, with ligenous prop roots to 3 mm in diameter. Leaves linear, acute at apex (obtuse at extreme tip), slightly falcate, serrulate on margins, to ca. 32 cm long, to 7 mm wide, 5–11-veined, base with scarious, smooth (not rugulose) alae. Scape declinate, complanate, fluted, to ca. 15 cm long. Racemes to 6.2 cm long. Flowers 1–4 in each bracteal axil. Bracts lanceolate, scarious at margin, minutely serrulate on margins in upper part, to 13.5 mm long. Pedicels articulate in upper

part, to 9 mm long. Perianth lobes ovate-oblong, obtuse at apex, 4.2–5 mm long, 1.8–2.2 mm wide. Anthers 2.8–3.2 mm long. Filaments broadened toward base, to ca. 0.3 mm long. Style subulate, ca. 5 mm long. Ovary inferior, concave at apex. Young seeds oblong.

Distribution: N Vietnam (known only from the type material).

Ophiopogon platyphyllus var. *hayatae* (Figs. 3–6) is basically similar to var. *platyphyllus* in both floral and vegetative characters. For example, they are consistent with each other in having an ovary concave at the top (Fig. 6; for var. *platyphyllus* see Fig. 6B in Tanaka 2000b). However, var. *hayatae* differs from var. *platyphyllus* in the pedicels

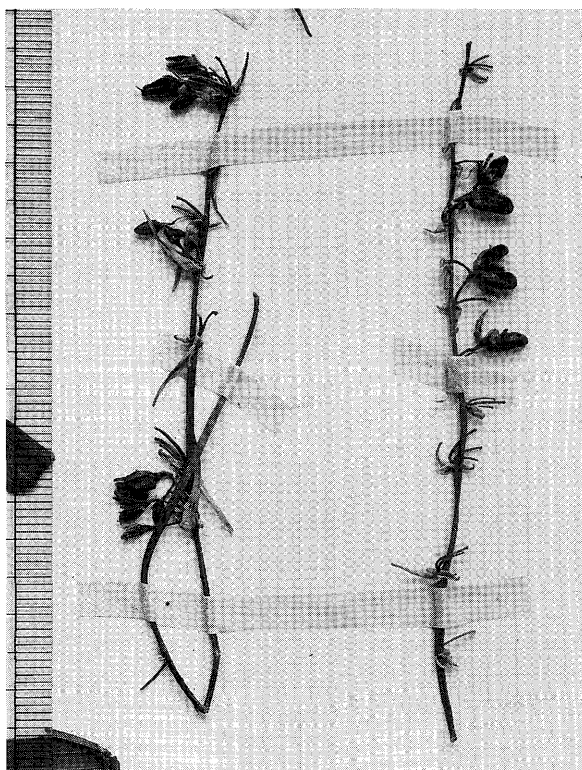


Fig. 5. Close-up of inflorescences (left in flower, right in fruit) in the holotype of *Ophiopogon platyphyllus* var. *hayatae*.

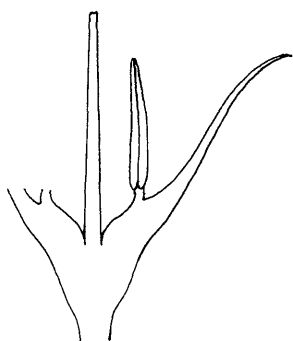


Fig. 6. Diagram of flower of *Ophiopogon platyphyllus* var. *hayatae* (side view).

articulate in the upper part (in the latter they are articulate in the lower part). Besides this, var. *platyphyllus* usually has wider leaves (ca. 6–22 mm wide) and larger flowers (perianth lobes 5.3–7.5 mm long, anthers 3.3–4 mm long) than var. *hayatae* [in Flora Hainanica (Anonymous 1977), *O. platyphyllus* is reported to have perianth lobes 5–6 mm long and anthers about 3–4 mm long. Dai and Chen (1978) described perianth lobes as about 7 mm long and anthers as about 6 mm long in the same species from China].

So far there has been no previous record of *O. platyphyllus* from Vietnam. Now it has become evident that this species is represented by var. *hayatae* in northern Vietnam, and by var. *platyphyllus* in southern China (Dai and Chen 1978, Tanaka 2000b). However, the present status of our knowledge on this species is still unsatisfactory. It is desirable to further investigate the variation and distribution of this species.

Representative specimens of *Ophiopogon platyphyllus* var. *platyphyllus* examined for comparison with var. *hayatae*:

China. Hainan Prov. Hainan Isl., Ngai Xian, Likchoi, Yueling, 1800 m, May 6, 1933, F. C. How 70701 (PE); Hainan Isl., Yaichow, 1800 ft., Mar.–Jul., 1933, fl., F. C. How 70701 (K); Hainan Isl., Five finger Mt., Apr. 23, 1922, fl., F. A. McClure 9334 (K);

Hainan Isl., Poting, ca. 1200 ft., Apr. 10, 1935, fl., F. C. How 71809 (A); Hainan Isl., Poting Xian, Nov. 17, 1936, fr., X. Q. Liu 28225 (IBSC 135994); Hainan Isl., Poting Xian, Apr. 10, 1935, buds, F. C. How 71809 (IBSC 95386); Hainan Isl., Poting Xian, Aug. 22, 1935, F. C. How 73487 (PE); Guangdong Prov. Taishan Xian, May 23, 1981, fl., Z. X. Li 597 (IBSC 463244); Maoming Xian, Aug. 3, 1956, fr., L. Tang 1785 (KUN 224828).

(21) *Ophiopogon japonicus*

According to Jessop (1979), *Ophiopogon japonicus* (Thunb.) Ker Gawl. is a commonly cultivated garden plant in Java and other places in Malesia, especially for lining borders, but never flowering in the lowland. In the experimental garden of our university, several plants which were sent as *O. japonicus* from the Botanical Gardens of Indonesia, Bogor, West Java, have been in cultivation since 1988 (specimens cited below). These plants have slender stolons, narrow leaves less than 3 mm wide, short scapes up to about 8 cm long, and globose, glossy deep blue seeds. They flower almost every year in our garden. There is no doubt that they are *O. japonicus*. Although *O. japonicus* has often been recorded from southern Asia (Wallich 1832, Koorders 1911, Rodriguez 1934, Jessop 1979), I have seen no specimen of this species occurring naturally in this area (excl. China) (cf. chapter 8 in Tanaka 2000a and chapter 14 in Tanaka 2000c).

Specimens: cultivated in Botanical Gardens of Indonesia, Bogor, West Java, then in Teikyo University, Tokyo, Japan, since 1988, Jul. 14, 1991, fl., and Oct. 9, 1994, fr. (Herb. Teikyo Univ.).

(22) Species of *Ophiopogon* of southern Asia

The following key is for the 17 species of *Ophiopogon* so far recognized in this series of research (Tanaka 1998, 1999a–1999d, 2000a–2000e). Of these, *O. japonicus* is known only from cultivation in southern Asia (cf. chapter 21). *Ophiopogon platy-*

phyllus var. *platyphyllus* has not been recorded from southern Asia. *Ophiopogon gracilipes* Craib (Tanaka 1999a) is excluded from this key, as it was transferred to *Peliosanthes* (Tanaka 1999d).

Key to the species and infraspecific taxa of *Ophiopogon* of southern Asia (excl. China)

The number in front of the name of taxa corresponds to that in the list of taxa presented after this key.

*: known only from cultivation.

** : not recorded from the area here covered.

1. Stem short, with or without subterranean stolons
2. Anthers united laterally....6) *O. griffithii*
2. Anthers free
3. Leaves with narrowly oblong to nearly elliptic blades
4. Flowers 1–3 in each bracteal axil, perianth lobes 4–7 mm long, anthers 1.9–2.3 mm long, leaves usually somewhat thick papery or subcoriaceous14) *O. regnieri*
4. Flowers often 3–5 each bracteal axil, perianth lobes 3.5 mm long, anthers 2.7–4 mm long, leaves coriaceous16) *O. tonkinensis*
3. Leaves linear
5. Leaves less than 3 mm wide8) *O. japonicus**
5. Leaves more than 3 mm wide
6. Roots thick, usually up to 4 mm in diameter, inflorescence usually more than ca. 1/3 of overall scape length
7. Leaves without white stripes11A) *O. longifolius* f. *longifolius*
7. Leaves with white stripes11B) *O. longifolius* f. *albostriatus* (*?)
6. Roots thin, usually up to ca.2 mm in diameter, inflorescence usually less than ca.1/3 of overall scape length.....7) *O. intermedius*
1. Stem elongate

8. Anthers connate laterally9) *O. kradungensis*
8. Anthers free
9. Filaments united laterally
10. Filaments united along their entire length1A) *O. caulescens* var. *caulescens*
10. Filaments united approximately halfway from the base up1B) *O. caulescens* var. *prolifer*
9. Filaments free or almost free
11. Scarious wings of leaf-sheath usually transversely rugulate, leaves fasciculate on apical part of stem or arranged consecutively along stem.....2) *O. chingii*
11. Scarious wings of leaf-sheath usually not rugulate, leaves fasciculate on apical part of stem or at intervals on stem
12. Leaves less than 4 mm wide, roots less than 1.5 mm in diameter15) *O. reptans*
12. Leaves more than 4 mm wide, roots more than (1–) 1.5 mm in diameter (usually developing as prop roots)
13. Ovary convex at top (or basal part of style inflated)
14. Leaves narrow, up to ca.6 mm wide, chartaceous.....12) *O. pierrei*
14. Leaves wide, up to 28 mm wide, coriaceous17) *O. vietnamensis*
13. Ovary rather flat at top
15. Inflorescence ca.6 cm long (in early stage of flowering), pedicels up to 4.5 mm long (at anthesis), flowers 1–3 in each bracteal axil, leaves ca. 35–70 on each plant, up to 1 cm wide3) *O. confertifolius*
15. Inflorescence ca.17 cm long, pedicels up to 10 mm long (at anthesis), flowers 2–6 in each bracteal axil, leaves ca.36 or less on each plant, up to 1.5 cm wide10) *O. latifolius*
13. Ovary concave at top
16. Leaves fasciculate only at top of stem
17. Pedicels articulate in lower part, leaves up to 22 mm wide.....

- ..13A) *O. platyphyllus* var. *platyphyllus***
 17. Pedicels articulate in upper part, leaves up to 7 mm wide
13B) *O. platyphyllus* var. *hayatae*
 16. Leaves fasciculate at intervals on stem
 18. Leaves up to ca.41 cm long and 1.9 cm wide, with narrowly elliptic to linear blades4) *O. cordylinoides*
 18. Leaves up to ca. 21.5 cm long and 3.7 cm wide, with elliptic to narrowly oblong blades5) *O. dracaenoides*

List of species and infraspecific taxa in the above key

- 1A) *Ophiopogon caulescens* (Blume) Backer var. *caulescens*.....
 ...Tanaka 2000e (cf. also Tanaka 2000a)
 1B) *O. caulescens* (Blume) Backer var. *prolifer* (Lindl.) N.Tanaka
 ...Tanaka 2000e (cf. also Tanaka 2000a)
 2) *O. chingii* F.T.Wang & Ts.Tang.....
Tanaka 2000b
 3) *O. confertifolius* N.Tanaka...This paper
 4) *O. cordylinoides* Prain...Tanaka 2000e
 5) *O. dracaenoides* (Baker) Hook.f.
Tanaka 2000a
 6) *O. griffithii* (Baker) Hook.f.
Tanaka 1999c
 7) *O. intermedius* D.Don....Tanaka 2000c
 8) *O. japonicus* (Thunb.) Ker Gawl.
This paper
 9) *O. kradungensis* M.N.Tamura.....
Tanaka 1999c
 10) *O. latifolius* L.Rodr.Tanaka 2000b
 11A) *O. longifolius* Decne. f. *longifolius*.....
 ...Tanaka 2000d (cf. also Tanaka 1998)
 11B) *O. longifolius* Decne. f. *albostratus* N.Tanaka.....
 ...Tanaka 2000d (cf. also Tanaka 1998)
 12) *O. pierrei* L.Rodr.....Tanaka 2000a
 13A) *O. platyphyllus* Merr. & Chun var. *platyphyllus*.....
 ...This paper (cf. also Tanaka 2000b)
 13B) *O. platyphyllus* Merr. & Chun var. *hayatae* N.Tanaka.....
This paper (cf. also Tanaka 2000b)

- 14) *O. regnieri* Bois.....Tanaka 1999b
 15) *O. reptans* Hook.f.Tanaka 1999a
 16) *O. tonkinensis* L.Rodr. ..Tanaka 1999b
 17) *O. vietnamensis* N.Tanaka.....
Tanaka 2000d

I express my deep gratitude to the directors and curators of the following herbaria for access to their material; A, C, IBSC, K, KUN, L, P, PE and TI. I also thank the director of the Botanical Gardens of Indonesia, Bogor, for providing some living plants of *Ophiopogon japonicus* cultivated there.

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Wallich N. 1832. *Ophiopogon japonicus*. In: A

numerical list of dried specimens of plants in the East India Company's Museum, p. 179, n. 5139.

田中教之：南アジア産ジャノヒゲ属の分類学的検討 X

マレー半島中部（タイ領）から1新種 *Ophiopogon confertifolius* を記載した。本種は、中国雲南省東南部の富寧（Funing）から記載された *O. fooningensis* とよく似ているが、後者よりもやや壮大で、葉数は多く（個体当たり約35–70枚）、苞は花や蕾よりも長い（同じ位の長さで、花被は白色である。*O. fooningensis* では、葉は個体当たり15–35枚あり、質はややより堅く、苞は花や蕾よりも短く（花序の下部は除く）、花被は淡紫色である。また、両種の産地は地理的にかなり隔たっている。両種は類似点も多い（茎は支持根を出し、葉は比較的細く、花柄が短く、その関節が開花時において中部以上にあり、子房の頂部が比較的平坦で、雄ずいが離生する点など）ので、今後より多くの資料に基づいて両種をさらに比較検討することが望まれる。本種は、同じマレー半島に産する *O. caulescens* (cf. Tanaka 2000a, 2000e) と同類

似するが、*O. caulescens* の花糸はその全長または下半部において合生し、子房は頂部中央が窪んでいるので区別できる。また、*O. pierrei* (cf. Tanaka 2000a) と同類するが、後者の子房上部は半球状に膨れるので異なる。故早田文蔵博士がベトナム北部で採集した標本に基づき1新変種 *O. platyphyllus* var. *hayatae* を記載した。花柄の関節が上部にあり、葉がやや細く、花が少し小さめであることで var. *platyphyllus* と区別されるが、両変種の変異を今後さらに多くの資料に基づいて検討することが望まれる。ベトナムでこれまで *O. platyphyllus* の記録はない。*O. japonicus* は南部アジア地域（中国は除く）において、野生することの確実な証拠は今のところ得ていない。

これまでの本研究で識別された同地域のジャノヒゲ属17種の検索表を示した。

(帝京大学文学部教育学科)